Researcher in Self-Driving Vehicles, Aalto University, School of Computer Communications, Programming Languages, Electrical Engineering, Finland.

Description

Title: Researcher in Self-Driving Vehicles
Employer: Aalto University
Job location: Lämpömiehenkuja 2, 02150 Espoo
Published: March 20, 2019
Application deadline: Unspecified
Job types: Postdoc, Researcher, Engineer
Fields: Computer Communications ,Programming Languages, Electrical Engineering

DESCRIPTION:
Aalto University is a community of bold thinkers where science and art meet technology and business. We are committed to identifying and solving grand societal challenges and building an innovative future. Aalto has six schools with nearly 11 000 students and a staff of more than 4000, of which 400 are professors. Our campuses are located in Espoo and Helsinki, Finland.
The School of Electrical Engineering is one of the six schools of Aalto University. Our portfolio covers fields from natural sciences to engineering and information sciences. In parallel with basic research, we develop ideas and technologies further into innovations and services. We are experts in systems science; we develop integrated solutions from care of the elderly to space robotics. The School is an international unit with close to 60 professors and 2 000 full-time students, including over 200 doctoral students.

Job Background
Recently, autonomous driving has gone from "maybe possible" to "definitely possible" thanks to the emerging technologies that are developed within the framework of multi-access edge computing (MEC) and 5G era. In December 2018, Google has officially started the commercialization of self-driving-car services in the suburbs of Phoenix. In fact, in an autonomous driving system, each vehicle would use a combination of devices including sensors, cameras, and radar to travel between different locations without human intervention, and by detecting and preventing both static and dynamic obstacles. The concept of autonomous vehicles promise many benefits for future transport but also brings significant challenges. Sensors onboard cars provide a huge amount and variety of data. The challenge is to exploit these data by exploring artificial intelligence (AI), such as deep neural networks and reinforcement learning techniques for making the right decisions in a reliable fashion within a short time. For enabling fully/partially self-driving cars, we need to enable different types of communications including V2I (vehicle-to-infrastructure) and V2V (vehicle-to-vehicle) communications. Indeed, a single fully self-driving car is able to daily generate around 4000 GB of data, whereby the cameras should transmit at a rate of 20-60 Mbps, radar upwards of 10 kB/s, sonar 10-100 kB/s, GPS producing 50 kB/s, and LIDAR ranging between 10-70 MB/s. Definitely, 4G system, with speeds of about 12 Mbps and latency of 50ms, is not able to satisfy the requirements of fully/partially self-driving car services. Therefore, fully/partially self-driving car services will require an unfailing, robust and omnipresent wireless network that has extensive coverage, high data transfer speeds, and low latency. For this reason, AI, and MEC and 5G will play a crucial role in enabling fully/partially self-driving car services.

Job Requirements
We are looking for highly-motivated developers, young researchers and experienced postdoc researchers who are willing to conduct high-quality research works, developing efficient approaches and methods that leverage AI, MEC and 5G technologies to enable different automation levels of self-driving vehicles. Depending on the job level, candidates should have either Master or Ph.D. degrees in a related field with a focus on artificial intelligence, cloud computing, and networking and communications.

We expect that candidates should have good analytical skills including, but not limited to, optimization, artificial intelligence and queuing theories. We expect that the candidates have expertise in programming languages (Python, C/C++, Java), cloud environments (Kubernetes, OpenStack), simulators (CARLA), open source tools (Automotive Grade Linux, pache libcloud, Open Source Mano, K8s and Jenkins), and different SDN technologies (e.g.,

OpenDayLight and ONOS). Candidates applying for postdoc positions should have a good publications record in very good journals and conferences.

Research Group
The MOSA!C Lab is led by Prof. Tarik Taleb. The lab belongs to the Communications and Networking Department, School of Electrical Engineering, Aalto University. It consists of a group of highly-enthusiastic researchers with strong hands-on programming skills and expertise in different areas relevant to mobile networking, cloud computing, Internet of Things, and UAV. The lab is involved in a number of research projects funded by different industries, Business Finland, The European Commission, and Academy of Finland. MOSA!C Lab conducts high-quality research with high industrial applicability and contributes to open source projects.

How to Apply
Please submit your application through our recruiting system by using "Apply now!" link below. Please include the following documents in English:
Motivation letter
Research vision on the topic
Detailed CV including the list of publications, developed tools and softwares
At least 3 recommendation letters
The evaluation of the applications will start immediately and will continue until the positions are filled. Please note that incomplete applications will not be regarded.
The initial contract is for 12 months, extensible based on performance. We wish you would be able to start as early as possible.
About Finland
As a living and work environment, Finland consistently ranks high in quality-of-life. For more information about living in Finland please visit our information pages for international staff: aalto.fi/aalto-university/international-staff-guide